

REMARKS/ARGUMENTS

Favorable reconsideration of this application in view of the above amendment and following remarks is respectfully requested.

Claims 1-3 are pending. In the present amendment, Claim 1 is currently amended and new Claims 2 and 3 are added. Support for the present amendment can be found in the original specification, for example, at page 3, lines 15-29, at page 4, lines 1-15, and in Figures 1-3. Thus, it is respectfully submitted that no new matter is added.

In the outstanding Office Action, Claim 1 was rejected under 35 U.S.C. § 112, second paragraph; and Claim 1 was rejected under 35 U.S.C. § 103(a) as unpatentable over Rapp (U.S. Patent No. 2,963,128) in view of Koeller et al. (U.S. Patent No. 3,158,527, hereinafter “Koeller”), Weber (U.S. Patent No. 3,341,395), or Stern et al. (U.S. Patent No. 4,227,356, hereinafter “Stern”).

In response to the rejection under 35 U.S.C. § 112, second paragraph, Claim 1 is hereby amended to cure the issues cited in the Office Action. In view of amended Claim 1, it is believed that all pending claims are definite and no further rejections on that basis are anticipated. However, if the Examiner disagrees, the Examiner is invited to telephone the undersigned who will be happy to work with the Examiner in a joint effort to derive mutually acceptable language.

Turning now to the rejection under 35 U.S.C. § 103(a), Applicants respectfully request reconsideration of this rejection and traverse this rejection, as discussed below.

Amended Claim 1 recites:

A sandwich panel, comprising:

two skins; and

a zigzag corrugated core having alternating protrusions and recesses placed between the skins and connected to the skins by an adhesive composite material, wherein

the core is a folded core made from a sheet blank with protrusions zigzag bending lines, recesses zigzag bending lines, and saw-tooth bending lines crossing the zigzag bending lines,

plane slanting sides of the folded core are connected to each other along the protrusions zigzag bending lines and the recesses zigzag bending lines by curvilinear parts whose folded core radius along the zigzag bending lines is not less than a core material sheet blank thickness,

perforation lines provided along the zigzag bending lines enable penetration of the adhesive material through holes of the perforation lines and into crimps, and

the adhesive material forms a head and body of a rivet in the crimps during assembly of the core and the skins.

The sandwich panel described in amended Claim 1 includes perforation lines along the zigzag bending lines. Since the ribs of a folded core layer formed along the bending lines should be sharp, i.e. made with a small radius, the perforation lines form hollows in the ribs. In doing so, the depth of a hollow depends on how sharp is the rib made, i.e. on a bend radius. With a bend radius approaching zero, the depth of the hollows will approach the radius of a perforation line. By bounding a minimum value of a bend radius, the depth of a hollow is bounded, and this is important for holding the adhesive material within a hollow. Moreover, the perforations lines provided in the sheet are narrowed down when bending, which may prevent the adhesive material from being penetrated inside a crimp. Thus, limitation of a minimum value of a bend radius is advisable to bound narrowing of the sites of perforation. It is respectfully submitted that the cited references do not disclose or suggest each feature recited in amended Claim 1.

Rapp describes a sandwich panel comprising a zigzag shaped core 20 sandwiched between face sheets 10, 12.¹ As conceded in the Office Action in section 6 on page 3, Rapp fails “to teach holes in the corrugated core used to aid in bonding the face sheets thereto with

¹ See Rapp, at col. 2, lines 47-60.

adhesive.” The Office Action relies on Koeller, Weber, or Stern to cure the deficiencies of Rapp.

However, it is respectfully submitted that Koeller, Weber, and Stern do not disclose or suggest a sandwich panel wherein “perforation lines provided along the zigzag bending lines enable penetration of the adhesive material through holes of the perforation lines and into crimps,” as recited in amended Claim 1.

Koeller discloses a sandwich panel 21 including two face sheets 25, 28 and a V-shaped corrugated core with indents along protrusion bending lines and truss members 27 along recess bending lines.² The indents 24 are made in right angular relation to the apex lines after making the corrugated core perpendicular to the apex lines.³ An adhesive material is placed in the indents above the truss members 27 as well as long fold line 22.⁴ However, it is difficult to make indents 24 perpendicular to the bending lines and Koeller does not describe a technology to make the indents perpendicular to the bending lines. In the sandwich panel described in Claim 1, however, perforation holes are made in the core plane blank before making of a corrugated core, thus allowing the indents to be made easily.

Weber discloses a sandwich panel 15 including two skins 16,17 and a corrugated core 18 with perforation holes.⁵ The top and bottom portions of the core portions are embedded in the skins and have spaced apertures located at least in part within the bodies of the skin members.⁶ The plastic material of skins 16, 17, applied in liquid form during construction of the panel, interlocks with the marginal apertures.⁷ However, it is noted that a folded core layer with zigzag bending lines generally has sharp ribs formed along the bending lines.

² See Koeller, at col. 3, line 40 to col. 4, line 3, and in Figs. 2-7.

³ See Koeller, at col. 3, line 40 to col. 4, line 3.

⁴ See Koeller, at col. 4, lines 30-35.

⁵ See Weber, at col. 2, lines 10-25.

⁶ See Weber, at col. 2, lines 26-33.

⁷ See Weber, at col. 2, lines 34-42, and in Fig. 5.

Accordingly, Weber does not disclose or suggest “folded core radius along the zigzag bending lines is not less than a core material sheet blank thickness,” as recited in amended Claim 1.

Stern describes a composite foam roof insulation comprising two skins 10, with a wave-like corrugated member 12 extending along each of the skins 10, and foam 17 extending between both corrugated members 12 and penetrating through holes provided in curved portions located at a distance from the skins 10. The connection of the corrugated members 12 to the skins 11 is made by an adhesive. However, Stern lacks a zigzag corrugated core extending from one skin to the other. The claimed sandwich panel core is a folded core layer that is not undulating. The claimed folded core layer includes ribs formed along the bending lines. In other words, the undulating core layer disclosed by Stern can not be made zigzag, because it would cease to be wave-like.

Accordingly, it is respectfully requested that the rejection of Claim 1 as unpatentable over Rapp in view of Koeller, Weber, or Stern be withdrawn.

New Claims 2 and 3 are added by the present amendment. Support for new Claims 2 and 3 can be found in the original specification, for example, at page 3, lines 15-29, and at page 4, lines 1-15. Thus, it is respectfully submitted that no new matter is added.

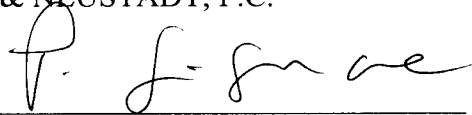
Additionally, new Claims 2 and 3 are dependent on Claim 1, and are thus believed to be patentable for at least the reasons discussed above with respect to Claim 1. Accordingly, it is respectfully submitted that new Claims 2 and 3 further patentably define over the cited references.

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Consequently, in view of the present amendment, no further issues are believed to be outstanding in the present application, and the present application is believed to be in condition for formal allowance. A Notice of Allowance is earnestly solicited.

Respectfully submitted,

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A handwritten signature in cursive script, appearing to read 'P. J. Signore', written over a horizontal line.

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